

*Watson (W-P.)*

(WITH THE COMPLIMENTS OF THE AUTHOR.)

THE THERAPEUTICS  
OF  
HIGH TEMPERATURES  
IN  
YOUNG CHILDREN.

INDEX  
MEDICUS

BY

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## THE THERAPEUTICS OF HIGH TEMPERATURES IN YOUNG CHILDREN.

*A Clinical Lecture Delivered at the New York Polyclinic.*

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[Reported by J. D. PATTERSON, M.D.]

GENTLEMEN.—During this session we have seen many cases where the high temperature had an important bearing on the course of the disease under consideration; and you will find in private practice that this element is not an exception, but rather the rule in a large majority of cases; and even more than this, you have probably heard, and will undoubtedly hear physicians say, “the high fever went to the head and killed the child.” As I have but casually called your attention to the treatment of this condition in the several cases already examined—purposely leaving the discussion of so important a subject until you had seen its varied effects in different cases—I think we can spend this hour profitably in reviewing some of the means applicable in reducing a high temperature.

In the first place, let me impress upon you the necessity of taking the temperature of every infant or young child (unless a recent injury), before you prescribe any treatment. Don't be guided by the sense of touch; you have seen here how deceptive that is. You have seen cases where apparently the temperature was not elevated, and yet the thermometer showed a rise of two or three degrees, and *vice versa*. Even if the extremities are cold, don't imagine that the temperature is low, for you have seen cases in this clinic with cold extremities and yet the temperature was 104°F. You may approximately estimate the degree of fever, in the absence of a thermometer, by

(1)





the general development of the child, whether well-nourished or emaciated; the condition of the extremities as compared with the body, whether uniform, or the one cold and the other hot; the condition of the anterior fontanelle (if open), whether bulging or depressed, and the mental condition, whether drowsy or restless as compared with intelligence and quiet. Usually, however, your best guide will be the sense of touch of the abdominal wall.

Always take the temperature of your little patients in the rectum; this way may not be so neat as others, but you are looking for absolute facts, and you should always use every legitimate and reasonable means to obtain them.

As a rule, most young children bear a high temperature better than adults; thus, a temperature of 104°F. will usually produce far more serious effects in the adult than in the infant.

A good general rule in the management of all cases with a high temperature, *i. e.*, over 102°F. in the young, is to keep them off of feathers and flannel. During the existence of the fever have them clothed in cotton flannel or muslin, and keep them on a smooth even surface made with a hair or straw mattress, simply covered with an ordinary quilt or several folds of a sheet. Keep the temperature of the sick-room, if possible, at about 75°F., and have it well ventilated and with plenty of sunlight.

Remember that as with adults so with young children, "fever patients" are not liable to "take cold."

Again, in all these cases give the child all the water it will drink, and that, too, notwithstanding it is immediately vomited. In some cases, where the vomiting is obstinate, an enema of luke-warm water, a gill at a time, frequently repeated, will be beneficial in quenching the thirst.

Our limited time will allow me to speak of only a few of the valuable febrifuges. These we may arbitrarily classify in two divisions, Internal and External Remedies.

I. INTERNAL REMEDIES.—While I do not intend to speak of the causes of high temperature to-day (as we daily go over that ground with each case appearing before us), yet

you must remember that in some cases your treatment must be directed toward the removal of an existing exciting cause. Thus, you may have a high fever from an acute attack of indigestion, and obviously you should relieve that. This, then, leads me to say that it is good practice in nearly all your cases with high fever to precede your regular febrile treatment by cleaning out the gastrointestinal canal. You can do this with castor oil, rhubarb, and frequently combined with soda, or with calomel and soda, as in this prescription,

R<sub>y</sub>—Hydrarg. chl. mitis, gr. i to iij;  
Sodii bicarbonatis, gr. ij to xv.

followed by a seidlitz powder in milk, in three or four hours. The most available, and, at the same time, valuable internal remedies are aconite, quinine, and antipyrine.

1. *Aconite*.—The best preparation of this drug to use is the tincture of the root, and is given in plain water, or it may be combined with other febrifuges.

On account of its comparative tastelessness, it is readily taken by young children, and as I have told you about all tasteless and non-irritant medicines, it is best to give it in small and frequently repeated doses.

On account of its frequent prostrating effects, you should see the child taking it every two or three hours. When this is impossible, I have found the following plan to answer very well, viz: For a child under two years of age, I prescribe one-twelfth of a drop every fifteen minutes for the first hour, and then every half-hour for two hours, and subsequently every hour, until my next visit. You will, however, get better results from it if you give it every ten or fifteen minutes, and see the child at least every second hour. A precaution that I always give the mother is to stop giving it when the child begins to perspire. This is usually, though not always, a reliable guide.

The indications for its use are a hot, dry skin, full and frequent pulse, and a temperature over 102° F. Hence, its value is most marked in the pneumonias, in the erup-



tive and desquamative stages of the exanthemata, and in the acute inflammations of the serous membranes.

While you will find this drug one of the most valuable anti-febrifuges, yet it will fail in some cases, and if you have produced a marked effect on the quality and frequency of the pulse, without any fall in the temperature, then you must abandon its use for another remedy which I will shortly tell you about. In some cases you will get excellent results with the following combination, viz:—

Ry—Tr. aconitii rad. gtt. ij;  
       Sp. æth. nitrosi, ʒij;  
       Glycerinæ, ʒij;  
       Liq. ammon. acet. q. s. ad. ʒij;  
 M. S. ʒss, q. h.

If the child has more or less delirium, it will be well to add five or ten drops of paregoric to each dose as given. As I have frequently told you, it is always better to prescribe your preparation of opium separately, so that you can increase or diminish its quantity as desired.

2. *Quinine*.—For those of you who live in districts where malaria is either the primary or a complicating factor in nearly all diseases, quinine will be your sheet-anchor. You can use it in any of the following ways, viz:—

Quinine	{	Per Orem	{ Powder	{ Milk, Coffee, Cocoa, Liquorice.
		Per Rectum	{ Liquid Suppository, Enema.	
		Hypodermically, or by Inunction.		

In nearly all cases it will be advisable to precede the use of quinine by the mouth by a cathartic. One of the best ways to give quinine by the mouth to young children is in the form of a powder in one of the menstrua just mentioned. When given this way have the quinine

dispensed in one-grain powders, and add one or more, as desired, to a teaspoonful of the milk, coffee, chocolate, or liquorice, at the time of its administration.

Sometimes I add ten or fifteen drops of the fluid extract of liquorice-root to the teaspoonful of milk, in which the bitter taste of the quinine is very well disguised. Again, you will find cases which will take the quinine in powder alone.

The Elix. Taraxaci Comp. is also a very good vehicle for the administration of quinine, and there are also several other compounds upon the market for a similar object, but I don't think you will require them, especially with children. As with adults, so with children, the most reliable effects will be obtained from the use of an acid solution of the quinine, but its very bitter taste would be objectionable in most cases.

I have frequently used quinine in suppositories with very satisfactory results. I think it well, without some marked indication to the contrary, to combine with it a minute dose of opium, to allay, in some degree, the local tenesmus of the gut. When used in this way, I prescribe double the quantity that I would by the mouth. The best menstruum is cocoa butter, and after the introduction of the suppository within the sphincter, the buttocks should be pressed firmly together for several minutes.

It will be well for you to remember that these suppositories may so irritate the lower bowels as to simulate dysentery.

Keating recently related to me a case where this condition had existed, and been treated as an attack of dysentery for several weeks, which, on coming under his care, was quickly relieved by a suppository of cocoa butter.

But you will find cases where quinine is not tolerated by the stomach, which will be effectually relieved by the same in suppository. I always use the ordinary sulphate.

I have never had occasion to use quinine in an enema. It is, however, recommended by several writers. The dose should be the same as in a suppository, and the least irritant preparation should be used.



You will frequently have occasion to use quinine hypodermically, and usually with good results. The best location for the injection is the buttocks. The dose should be from a half to two-thirds of that for the stomach. I have always used the bisulphate, which, with the addition of a little heat, is soluble in eight parts of water.

Quinine has also been used by inunction, with some oleate as a menstruum, but rather in chronic than acute cases.

I have thus hurriedly called your attention to this drug and, at the same time, do not advise you to use it as an antipyretic unless there are malarial elements to the case.

When you have a temperature of 106°F. of undoubted malarial origin, and there are no immediate complications apparent, use quinine hypodermically, and repeat it in an hour if required.

3. *Antipyrine*.—The last of the internal remedies I shall call your attention to is antipyrine. During the past year, or two, it has been used quite extensively in this country, and for sometime previously in Germany. There seems to be no special indications for its use, excepting a high temperature regardless of its cause. It may be given by the stomach, by the rectum, or hypodermically. The best way to give it is in three successive doses at hourly intervals, which can be repeated in six hours if necessary, and for a child under seven years of age the dose, to begin with, is one grain for every one and a half years of the child's age. This dose should be doubled in the second series of these doses. Usually, however, the temperature remains down several degrees for about eighteen hours after the first series of these doses, and then does not reach its previous height. If given in an enema, double the quantity should be administered at the same intervals. If given hypodermically, half the quantity dissolved in warm water can be used.

I have used it in several cases with good results, and its administration was accompanied by no vomiting, prostration, etc. I have also used it in cases where it had no



appreciable effect on the temperature. However, if more extended and extensive trials shall confirm results already obtained, antipyrine will be one of our most valuable antipyretics. When you have a temperature of 104° F., and over, and where there are no signs of immediately impending danger, use antipyrine. It seems to do no harm.

These, then, are the three principal antipyretics used internally. There are many others, it is true, but I think you will find these most applicable, and when they fail you, the others would also, and you would have to resort to the external remedy, water, finally.

To summarize the indications for the use of each of these three internal remedies, I would advise you to use aconite, in small and frequently repeated doses, when you have a hot dry skin with full and rapid pulse; to use quinine when there is any suspicion that malaria is an exciting element; and to use antipyrine when these have failed or are contra-indicated.

But, gentlemen, you will see cases before you have been in practice very long, where you will be unable to reduce the high temperature with either of the internal remedies just mentioned, or with any other internal remedy you may employ.

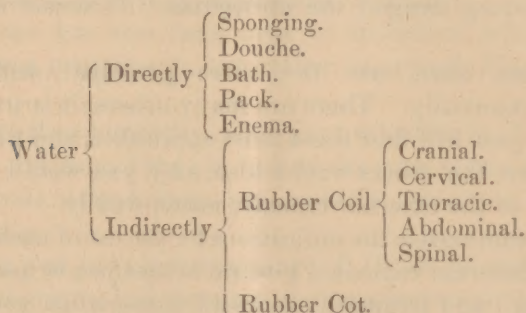
You will see cases dying from a high temperature before the effect of any internal remedy could be obtained. You will remember that Professor Ripley, during the past winter, has taught you that an excessively high temperature produces such changes in the gastric juice as to destroy its digestive properties.

You will see cases where convulsions will follow the high temperature to sudden death. And just here let me remind you of the importance of taking the temperature in every case of convulsions you may be called upon to attend.

You can reduce any temperature, and that, too, with a remedy which you will always have at hand wherever you may practice medicine—*i. e.*, water. Furthermore you can reduce the temperature safely and prolong, if not

save, the life of the little patient; at least you will not have done your duty until you have made every effort to reduce the high temperature which is killing the child.

You can use the water in any one of the following ways, viz.:



I. DIRECT APPLICATION.—In this way the water is applied to the surface of the little patient's body. And here let me say to you that, in all these different modes of application, the water is applied to the head, thorax, and abdomen, and sometimes to the neck, and you are *always* to remember to *keep the extremities warm*, and that, too, by the use of artificial heat. It frequently is necessary to wrap the extremities, especially the lower ones, in flannel or cotton wadding, and have them surrounded with bags or bottles of hot water. This point is of the greatest importance and should never be overlooked.

1. *Sponging*.—This is the easiest and frequently a very efficacious way of using the water. If you have a temperature of 105° F., with no serious complication impending, you can have the child's clothes removed, and place it on the smooth surface previously mentioned (with a rubber sheet beneath the cotton sheet), and with water at 90°, commence to sponge the thorax and abdomen, and, at the same time, have the water gradually cooled down to 70°, turning the child first on one side and then on the other, so that the back can be frequently sponged. Do this for thirty minutes, and you will probably find the rectal temperature down to 102° or 101°; if so, I usually



wring out a piece of muslin, long enough to reach from the shoulders to the hips, in equal parts of whiskey and water, to which a little ground mustard has been added, and wrap this around the child's body; then covering the child with an ordinary sheet, allow it to remain in this way for one or two hours. If, at this time, the temperature remains down, the child can be removed to a dry surface, but not dressed for at least three hours more, when, if the temperature still remains down, it can be lightly dressed. During all this time, cloths dipped in iced water should be repeatedly applied to the head, and if the child is comatose, a hot flaxseed poultice sprinkled with mustard, is kept applied to the nape of the neck. If the heart's action is feeble or irregular, I usually take a small sponge moistened in hot whiskey and water, sprinkled with mustard, and apply it over the pericardium for ten or fifteen minutes. During all this time the extremities have been kept warm, as previously described. In the meantime, the child has taken whatever nourishment it desired. Now, if malaria was the cause of the high temperature, primarily, you should administer quinine in some one of the ways I have already described; or you can keep the child in this way—*i. e.*, undressed, and when the temperature goes above  $103^{\circ}$ , either sponge it again or apply the whiskey-water sheet. However, if the temperature repeatedly goes up, after being thus reduced, it will be better to put the child either on a rubber coil or a rubber cot, which I will soon describe to you. I think this one of the most practical and feasible ways of reducing a high temperature in ordinary practice; the parents and friends, however skeptical, cannot object to it, for they see you commence with warm water, which you have gradually cooled, under the pretence that "the body is so hot that you must add ice to keep the water the same as when you commenced."

2. *Douche*.—When you have a temperature of  $106^{\circ}$  or  $107^{\circ}$ , with the child either in convulsions or profoundly comatose, more rapid work than the preceding must be done. In three cases of this kind, I have improvised a

Kibbe cot, with two chairs, a blanket, and a sheet. The chairs, with square-top backs, are placed back to back, about thirty inches apart, and over the tops the blanket is tightly stretched, and fastened with large safety pins to the centre cross-piece, in the back of each chair, respectively; then on this blanket the sheet is placed, and the undressed child on the sheet; beneath the blanket, and between the chairs, there is a small bath-tub. It is well to place a thin sheet over the thorax and abdomen of the child, so that the shock of the water will not be so great. When everything is in readiness, and you can do it all in the time I have been describing it to you, take water at a temperature of  $90^{\circ}$ , and pour it over the thorax and abdomen for three or four minutes, gradually having the water cooled down to  $75^{\circ}$  in the meantime, and there will be signs of returning consciousness within a few minutes. Within five minutes, the thermometer in the rectum will show a fall of four or five degrees in the body temperature; and here again keep the extremities warm. You can protect the legs from the water by a sheet tightly rolled up and placed under the thighs. If you put your hand underneath the blanket, over the middle of the back, you will be surprised to find the amount of heat there. Leave the child on this cot for several hours. Perhaps, after several hours the temperature will go up again, if so, then again apply the douche, but only for two or three minutes. One advantage in using the water in this way, is that you have it under your complete control, so that if there are any appearances of shock, you can apply warm or hot water instantly, and that, too, without moving the child. Of course you are to use this method only in desperate cases, and in families of intelligence, and with their full consent, after you have explained to them the gravity of the case.

3. *Bath.*—The cold bath has been used a great deal, but there is more or less (and I think most decidedly more) danger in its use. I have used it, and even on an infant only three weeks old, and with good results, but I do not advise you to use it now, for you have so many safer and



even more effectual ways of reducing a high temperature.

4. *Pack*.—The wet, or cold pack, consists simply in wrapping the body, from the shoulders to the hips, in a sheet wrung out of cool, cold, or iced water. It is usually a very effectual way of reducing a high temperature, and is used by a large number of practitioners. I have used it frequently, and in some cases the temperature kept on going up, notwithstanding the fact that the sheet was changed every ten minutes.

You must remember one thing about a cold pack, and that is that it must be changed every five or ten minutes, and thus constantly disturbing the patient, or else it becomes hot, and will act simply as any other moist application—*i. e.*, like a poultice.

5. *Enema*.—In cases where you must reduce the temperature very rapidly, enemata of cold water, a gill at a time, repeated every ten minutes, will do well in some cases. I have used it in one case with a temperature of  $107^{\circ}$ , caused by malaria. The infant was in convulsions when I was called in, and a syringe being at hand, I immediately gave it an enema of cold water, and repeated it in five minutes, after which the convulsion ceased; the enemata were repeated every ten or fifteen minutes for an hour, at which time I had obtained a solution of the bisulphate of quinine, which I gave hypodermically, and the high temperature or convulsions have not since re-occurred. I should advise you to use it only in similar desperate cases.

II. *INDIRECT APPLICATION*.—This method of using water in reducing high temperatures in young children consists in the use of tubing of rubber (lead or copper might be used) through which water is passed either from the hydrant or a syphon. The most convenient way of using it is to attach one end of the tube—*i. e.*, the receiving tube—to the water faucet of the hydrant, while the other end, or the discharging tube, is placed in the basin of the hydrant. The temperature, or degrees of cold, applied to the skin of the patient can be regulated in four ways, *viz.* :

1. By the temperature of the water used; 2. By the force

applied to the stream in passing through the tube; 3. By the thickness of, and covering over (as sheet or blanket) the tube; and 4. By the amount of clothing on the patient.

1. *Rubber Coil*.—Different varieties or shapes of tubing have been made applicable to most any portion of the body. The following are most applicable to children:

*a. Cranial*.—The size of tube ordinarily used for these different styles is that of a drainage-tube.

You will remember that I have told you to always keep the baby's feet warm and its head cool. Now, in these cases of high temperature, this injunction is especially imperative. I have already told you how to do the former, and while the latter can be done by the frequent application of ice-cold cloths, which is, perhaps, better in many cases on account of the rapid evaporation, yet there may be times when everything should be dry around the head and neck, and in all such instances the rubber coil for the head will answer every indication.

*b. Cervical*.—A very effectual mode of reducing a high temperature, and especially when there is any inflammatory action in or around the throat, or when a moderately high temperature threatens convulsions, is to use the rubber coil passing from ear to ear beneath the chin. Never let it pass entirely around the neck, for, as I have just told you, there are instances where a hot application to the nape of the neck is of special value.

*c. Thoracic*.—The coil for the chest may be either double or single—*i. e.*, for the back and front, either together or separately. In cases where there is more or less weakening of the heart's action, the coil should not be placed over the front of the chest.

*d. Abdominal*.—This form of coil, made so as to just cover the abdomen, is very valuable in the reduction of a high temperature.

The objection to all these forms of coils is that the constant moving about of the child gets them displaced, and while it might seem that bandaging them in position would answer, yet it does not.

*e. Spinal*.—The spinal can be so arranged as to over-



come this difficulty, and next to the abdominal form is the most valuable in these cases.

2. *Rubber Cot.*—I have now in use a cot made by the attachment of successive coils of tubing to sheet-lead, which I have found very serviceable in reducing any temperature to any desired point, and keeping it there as long as necessary. The child lies directly on the tubing, and the principle of regulating the degree of cold is the same as that in the rubber coils already described to you.

I am now having made a rubber cot, shaped like a pillow, with spiral springs inside so as to be comfortable for the little patient to lie upon.

I have thus, gentlemen, at considerable detail, described to you the different ways by which you can reduce any temperature; for I should regret to have any one of you go out into private practice from this clinic, and let any of your little patients die from a high temperature. True it is, that a high temperature is not always the cause of death, but what I wish to impress upon you is the fact, that when you have a high temperature you can surely and safely reduce it. No matter what the cause thereof, or what the existing conditions are, if the child is dying from the high temperature, it is your duty to reduce it; and if, after you have done that intelligently, the child dies, you have done your duty.













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